



# IECEX Certificate of Conformity

## INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit [www.iecex.com](http://www.iecex.com)

Certificate No.: **IECEX EUT 24.0012X** Page 1 of 3 [Certificate history:](#)

Status: **Current** Issue No: 0

Date of Issue: 2024-09-30

Applicant: **ATAM S.p.A.**  
Via Archimede, 7  
I - 20864 Agrate Brianza (MB)  
**Italy**

Equipment: **Electromagnets for valve actuator Type 481GD**

Optional accessory:

Type of Protection: **Encapsulation "mb"**

Marking: Ex mb IIC T3 Gb  
Ex mb IIIC T200°C Db  
-20°C ≤ Ta ≤ +60°C

Approved for issue on behalf of the IECEx  
Certification Body:

**Dionisio Bucchieri**

Position:

**Head of IECEx Certification Body**

Signature:  
(for printed version)

Date:  
(for printed version)

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**Eurofins Product Testing Italy S.r.l.**  
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Page 2 of 3

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Manufacturer: **ATAM S.p.A.**  
Via Archimede, 7  
I - 20864 Agrate Brianza (MB)  
**Italy**

Manufacturing locations: **ATAM S.p.A.**  
Via Archimede, 7  
I - 20864 Agrate Brianza (MB)  
**Italy**

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEX Quality system requirements. This certificate is granted subject to the conditions as set out in IECEX Scheme Rules, IECEX 02 and Operational Documents as amended

#### STANDARDS :

The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

[IEC 60079-0:2017](#) Explosive atmospheres - Part 0: Equipment - General requirements  
Edition:7.0

[IEC 60079-18:2017](#) Explosive atmospheres - Part 18: Protection by encapsulation "m"  
Edition:4.1

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

#### TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:

[IT/EUT/ExTR24.0010/00](#)

Quality Assessment Report:

[IT/CES/QAR15.0002/09](#)



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Page 3 of 3

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**EQUIPMENT:**

Equipment and systems covered by this Certificate are as follows:

Refer to the Annex file of this certificate.

**SPECIFIC CONDITIONS OF USE: YES as shown below:**

Refer to the Annex file of this certificate.

**Annex:**

[Annex to CoC IECEx EUT 24.0012X Issue N. 0.pdf](#)



**Annex to certificate:** **IECEX EUT 24.0012X Issue N. 0**

### Equipment description

The equipment, type 481GD consists of electrical coils intended for driving pneumatic/hydraulic valves (which are not part of this certificate).

It is intended to be supplied by mains or other supply line with a rated voltage not exceeding 240 V. The electrical winding of the solenoid consists of a copper wire wound on an insulating plastic body and subsequently overmolded with the same material. A metal ferrule is attached to the main body of the coil; this houses a non-resettable thermal link complying with the requirements of IEC 60691 and a double half-wave current rectifier (the latter only for AC supply versions) mounted on a PCB to which a 3-pole cable (having maximum operating temperature not less than 105 °C) is permanently connected before final encapsulation with epoxy casting compound.

The magnetic flux is closed by means of a carbon steel shield and washers that surround the outer perimeter of the moulded winding. The solenoid has a coaxial bore capable of accommodating a plunger with an outer diameter  $\varnothing$  22 mm; this part, as well as the pneumatic/hydraulic valve and any other magnetically operated parts by the 481GD solenoid, are outside the scope of this certificate being parts selected by the user for the final intended application.

The ambient temperature of the area where the device is to be used shall be included in the range  $-20^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}$ .

### Code designation:

Each product is identified with its marking by a model code as explained by the coding scheme reported below:

Type code: 481GD ①②③④

① = Rated power [W]

② = Alternate current / Direct current

0 = AC

1 = DC

③ = Cable length [m]

④ = Optional suffixes not influential on the equipment and the type of protection

**Temperature limitation and electrical rating:**

The temperature limits are closely related to the winding design parameters and the tripping temperature of the embedded thermal protection; each winding is sized on the basis of the supply voltage thus defining the following characteristic constructive limit parameters:

| Electrical ratings of D.C. version electromagnets type 481GD <input type="checkbox"/> 1 <input type="checkbox"/> <input type="checkbox"/> |  |   |  |                    |   |
|---|--|---|--|--------------------|---|
| Supply Voltage [Un] (V d.c.)  | Maximum thermal link trigger temperature [Tf] (°C) | Coil electrical parameters limits at Ta = Tcoil = 20 °C     |  |                    | Temperature Class / Maximum surface temperature |
|   |  | Maximum peak (initial) dissipated power by the coil [P] (W) | Maximum current Density (A/mm <sup>2</sup> ) | Frequency [f] (Hz) |   |
| 12 <i>Note</i> <sup>1</sup>   | 128  | 28 <i>Note</i> <sup>1</sup>                                 | 11.88  | 0 Hz               | T3 / T200°C                                     |
| 24  |  |   |  |                    |   |
| 48  |  |   |  |                    |   |
| 100   |  |   |  |                    |   |
| 110   |  |   |  |                    |   |
| 115   |  |   |  |                    |   |
| 120   |  |   |  |                    |   |
| 220   |  |   |  |                    |   |
| 230   |  |   |  |                    |   |
| 240   |  |   |  |                    |   |

*Note*<sup>1</sup>: The electromagnets having supply voltage 12 V d.c. are limited in minimum temperature or maximum peak power as reported below:

Case 1: Ta\_min = 0 °C & Maximum peak dissipated power = 28 W

Case 2: Ta\_min = -20 °C & Maximum peak dissipated power = 26 W

| Electrical ratings of A.C. version electromagnets type 481GD <input type="checkbox"/> 0 <input type="checkbox"/> <input type="checkbox"/> |  |  |  |                    |   |
|---|--|--|--|--------------------|---|
| Supply Voltage [Un] (V r.m.s.)  | Maximum thermal link trigger temperature [Tf] (°C) | Coil electrical parameters limits at Ta = Tcoil = 20 °C      |  |                    | Temperature Class / Maximum surface temperature |
|   |  | Maximum peak (initial) dissipated power by the coil [P] (VA) | Maximum current Density (A/mm <sup>2</sup> ) | Frequency [f] (Hz) |   |
| 24  | 128  | 28   | 11.88  | 50 Hz / 60 Hz      | T3 / T200°C                                     |
| 48  |  |  |  |                    |   |
| 100   |  |  |  |                    |   |
| 110   |  |  |  |                    |   |
| 115   |  |  |  |                    |   |
| 120   |  |  |  |                    |   |
| 220   |  |  |  |                    |   |
| 230   |  |  |  |                    |   |
| 240   |  |  |  |                    |   |

*Note: the coil electrical parameters indicated in the above tables represent the worst case limit (e.g. electromagnet having coil designed to dissipate less power are admitted).*

**Warning label:**

None

**Routine tests**

- According to Clause 9.1 of IEC 60079-18:2017 each equipment shall be submitted to the visual inspection on the relevant parts from which the “Ex mb” type of protection depends on (obtained both for molding, overmolding and pouring processes). No damage shall be evident, such as cracks in the compound, exposure of the encapsulated parts, flaking, inadmissible shrinkage, swelling, decomposition, failure of adhesion (separation of any adhered parts) or softening.

- According to Clause 9.2 of IEC 60079-18:2017 each equipment shall be submitted to the dielectric strength test. The test shall be conducted as detailed below:

| <b>Potentials/parts involved in the test</b>   | <b>Test conditions</b>   |  |   |   |
|--|--|--|---|---|
| Power supply wiring<br>⇔<br>Encapsulation /<br>overmolded coil surface +<br>earth connection | <b>AC method &amp; test duration ≥ 1 s</b>   | <b>DC Method &amp; test duration ≥ 1 s</b> | <b>AC method &amp; test duration ≥ 100 ms</b> | <b>DC Method &amp; test duration ≥ 100 ms</b> |
|  | <b>Test Voltage applicable to equipment having rated voltage <math>U \leq 90 V</math></b>            |  |   |   |
|  | 500 V r.m.s. +5% <sub>0</sub>  | 700 V d.c. +5% <sub>0</sub>                | 600 V r.m.s. +5% <sub>0</sub>                 | 840 V d.c. +5% <sub>0</sub>                   |
|  | <b>Test Voltage applicable to equipment having rated voltage <math>90 V &lt; U \leq 240 V</math></b> |  |   |   |
|  | 1500 V r.m.s. +5% <sub>0</sub>   | 2100 V d.c. +5% <sub>0</sub>               | 1800 V r.m.s. +5% <sub>0</sub>                | 2520 V d.c. +5% <sub>0</sub>                  |

The test voltage shall be increased steadily within a period of not less than 10 s until it reaches the prescribed value, and it shall then be maintained for the duration mentioned in the table above.

The test shall be deemed to have passed if no breakdown or arcing occurs as defined by Clause 8.2.4.2 of the standard IEC 60079-18:2017.

**Specific Conditions of Use**

- The equipment must be powered by supply line whose maximum current value is limited by the use of a time-delay fuse compliant with the standard IEC 60127 having the following parameters:

| Equipment supply voltage                               | Time-delay fuse parameters     |                              |                   |
|--|--------------------------------|------------------------------|-------------------|
|  | Max interrupting current $I_n$ | Minimum voltage rating $V_n$ | Breaking capacity |
| 12 V d.c.  | 2.8 A                          | 12 V                         | 1500 A            |
| 24 V d.c. / V r.m.s.                                   | 1.6 A                          | 24 V                         |                   |
| 48 V d.c. / V r.m.s.                                   | 800 mA                         | 48 V                         |                   |
| From 100 V d.c. / V r.m.s.<br>to 115 V d.c. / V r.m.s. | 500 mA                         | 120 V                        |                   |
| 120 V d.c. / V r.m.s.                                  | 300 mA                         | 120 V                        |                   |
| From 220 V d.c. / V r.m.s.<br>to 240 V d.c. / V r.m.s. | 200 mA                         | 240 V                        |                   |



- The device is intended to be installed in areas with low risk of impact and the installation method is limited as prescribed by the safety manual.
- In order to guarantee the limiting temperatures, it is always necessary to use this equipment together with a plunger assembly coupled with a metal valve body not smaller than the electromagnet part of this certificate. In addition, it is necessary to ensure that the surface of the metal valve body approaches the bottom metallic shield of the electromagnet with a gap not more than 2 mm in order to promote the heat dissipation of the electromagnet through the body of the valve.
- The thermal influences of the process in which the electromagnet is to be interfaced through the plunger assembly should be taken into account; it should be ensured that no part of the process plant with which the electromagnet is in contact can exceed the ambient temperature range  $-20^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}$ .